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Customer No. 01333 **Attorney Docket No. N81643LPK**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:
Wolfgang H. Alberstadt et al.

CONNECTION BETWEEN THE FLANGE AND THE BODY OF A FUSER ROLLER

U.S. Serial No.: 10/696,190

Filed: October 28, 2003

Group Art Unit: 2852

Examiner: Peter Lee
Supervisory Patent Examiner:
Arthur T. Grimley

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Date: June 30, 2005

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Enclosed herewith in triplicate is Appellants' Appeal Brief for the above-identified application.

The Commissioner is hereby authorized to charge any fees in connection with this communication, to include the Appeal Brief filing fee, to Eastman Kodak Company, Deposit Account No. 05-0225.

(A duplicate copy of this letter is enclosed.)

Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Wolfgang H. Alberstadt et al.	Examiner: Peter Lee Supervisory Patent Examiner: Arthur T. Grimley
Title: **CONNECTION BETWEEN THE FLANGE AND THE BODY OF A FUSER ROLLER**	Group Art Unit: 2852
U.S. Serial No.: 10/696,190 Filed: October 28, 2003	Eastman Kodak Company 343 State Street Rochester, NY 14650-2201

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37 AND 35 U.S.C. 134

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APPELLANT'S BRIEF ON APPEAL

Appellant hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of Claims 1, 3, and 6-8; along with Claims 4 and 9 which are objected to, as outlined in the Office Action mailed March 17, 2005.

A timely Notice of Appeal was mailed on May 4, 2005.

Real Party In Interest

As indicated above in the caption of the Brief, Eastman Kodak Company is the real party in interest.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect, or be directly affected by, or have bearing on, the decision of the Board of Patent Appeals and Interferences in the pending appeal.

Status Of The Claims

The claims pending in the instant Application are Claims 1, 3, 4, and 6-9. Claims 1, 3, and 6-8 have been finally rejected under 35 U.S.C. §103(a) as set forth in the Final Office Action mailed March 17, 2005. Also in such Final Office Action, Claims 4 and 9 have been objected to as being dependent upon a rejected base claim, but noted as containing allowable subject matter. Appellant hereby appeals to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection, rejecting Claims 1, 3 and 6-8, and objecting to Claims 4 and 9, as outlined in the Final Office Action dated March 17, 2005. Appendix I provides a clean, double-spaced copy of the claims on appeal.

Status Of The Amendments

There have been no amendments filed subsequent to the Final Office Action mailed March 17, 2005.

Summary Of The Invention

FIG. 1 shows a schematic view of a fuser mechanism 1 inside a printing machine (details of the printing machine are not shown). The printing machine can be an electrophotographic printing machine, for example. A sheet 6 is located on a conveyor belt 7 and is transported in the direction shown by arrow 8 into the nip area between a fuser roller 3 and an inking roll 2. The fuser roller 3 and the inking roll 2 are rotating in the directions shown by arrows 4 and 5. They are turning in the sheet's direction of movement 8. A heat source 10 that is located on the axle of the fuser roller is inside the fuser roller. This fuser mechanism, as it is shown here, is in principle already known from prior art.

In FIG. 2, the fuser roller 3 from FIG. 1 is shown. This is a lateral view and it contains a graphic cutout of the fuser roller 3, so that the heat source 10 is discernable inside the fuser roller 3. The flanges 11 are located on the ends of the fuser roller 3. The flanges 11 are connected to the body 12 of the fuser roller 3.

FIG. 3 shows a segment from a longitudinal section through the fuser roller 3. Shown here, in particular, is a connecting point between a flange 11 and the body 12 of the fuser roller 3. A connecting point can be seen in the area designated as 4a in FIG. 3. The connection of the flange 11 and the body 12 is established via a connecting element 13. A more descriptive view of this connecting point can be seen in FIG. 4a. The flange 11 is shaped such that it fits into the body 12. The diameter of the part that fits in the inside is sufficient to virtually fill up radially the hollow space of the body 12. The diameter of the flange 11 decreases toward the end of the body 12. A free space thus exists between the flange 11 and the inner side of the body 11, which is large enough to hold the connecting element 13, whereby the connecting element 13 rests specifically in an annular groove 14 in the body 12.

Bored holes for screws 15 are located in the flange 11. These bored holes are arranged radially around the center point of the flange 11. A spring plate 29 is located on the outward facing side of the flange 11. It is attached to the flange 11 by the screws 15. The spring plate 29 lies on the end of the body 12. A shoulder 21 is available on the face of the body's end for this purpose. In the configuration shown here the spring plate has an opening in its mid-area to accommodate an outwardly projecting part of the flange 11. This outer part of the flange 11 can be provided, e.g.,

with a connection to the rest of the printing machine that is not shown here. The fuser roller 3 can be set in rotation via this connection, or various electrical contacts between the fuser roller 3 and the rest of the printing machine can be made available. The heat element 10 that is located inside the fuser roller 3 can be operated in this way, or other elements not shown here, such as sensors, can be actuated or read.

By firmly screwing down the spring plate 29 to the flange 11, while at the same time the spring plate 29 is placed on the shoulder 21, one assures that the flange 11, while yielding to a certain extent, is secured against slipping farther into the inside of the body 12. By the spring plate 29, the part of the flange 11, that fits into the inside of the body 12, is pressed from behind against the connecting element 13. This connecting element 13 is located in the annular groove 14 such that the flange 11 can also not move farther toward the end of the body 12. Consequently, by the form fitted shapes of the flange 11, the connecting element 13, and the body 12, the flange is connected with great stability to the body 12.

The area designated 4a in FIG. 3 shows the area in which the connection between the flange 11 and the body 12 is made. The connecting element 13, in particular, is located here. An enlarged view of this segment is shown in FIG. 4a. For reasons of clarity, the spring plate 29 is not shown in FIG. 4a.

The connecting element 13 is located in a space between the flange 11 and the inside of the body 12. The body 12 has here a half-circular annular groove with a diameter that is commensurate with the width of the connecting element 13. The connecting element 13 here is a ball shaped element with approximately the same diameter as the annular groove 14.

In other exemplary embodiments, connecting elements 13 that have a circular cross section but a different longitudinal dimension may be used. In such cases it is expected that the diameter of the annular groove 14 will be commensurate with the diameter of the circular cross section of such a connecting element.

The shape of the flange 11 is such that, in the area that lies behind the connecting element, it extends across the entire hollow space of the body 12. The distance between the flange 11 and the body 12 is at least so small that even the part of the connecting element 13 that projects outside the annular groove cannot slip between the flange 11 and the body 12. The shape of the flange 11 changes in the area

inside of the body 12 that lies closer to the front end of the fuser roller. Here, the flange has an offset on the side facing the body 12, such that it tapers to such an extent that now the space between the flange 11 and the body 12 is large enough to hold the connecting element 13 while it is located in the annular groove 14. The offset 25 is defined such that it corresponds to a quarter circle whose radius approximates that of the connecting element 13.

FIG. 4b is a detailed representation of area 4b from FIG. 4a. In addition to a representation of the area of the connection between the flange 11 and the body 12, which is also shown in FIG. 4a, (corresponding to a state at nearly room temperature), the dotted line shows the position of the flange 11', the connecting element 13', and the body 12', as would be the case at a metal temperature of 220°C. The described position at room temperature is shown in solid lines.

For the change of position from room temperature to 220°C, it was assumed that the flange 11 will expanded by 0.6 mm and the body 12 by 1.0 mm, versus the situation at room temperature. In this process the expansion occurs in both the horizontal and vertical directions. Altogether, therefore, a change occurs in the geometric relationships of the connection between the flange 11 and the body 12. The flange 11 expands in the vertical direction so that it also changes the diameter of the body 12. For the change in length of the body 12, a change of 1.0 mm was assumed here, by which the center point of the annular groove moved. The flange 11 is shown in its new position by 11'. The same applies to annular groove 14 (14'), the body 12 (12'), the connecting element 13 (13'), and the offset 25 (25').

Thus, the connecting element 13 changes its position by a rolling motion in the direction of the arrow 24. By the tightened spring plate 29, the flange 11 is then pulled so far toward the end of the body 12, that it follows the change of position of the connecting element 13. Then, in its new position the connecting element 13' still lies between the flange 11' and the body 12' such that they are tightly connected together with no space between them. The point of contact between the connecting element 13' and the offset 25' shifts to a point that lies below the highest point of the connecting element 13'. This results in a gap 23 between the uppermost point on the connecting element 13' and the flange 11'. To better represent this gap

23 a line 22, which represents a tangent to the uppermost point on the connecting element 13', was introduced into the drawing. A line 26 has also been added here. It represents an extension of the lower border of the flange 11' behind the connecting element 13'.

The width of the gap 23 is dependent upon the temperature of the fuser roller. Different geometric changes occur as a function of temperature. At the temperatures expected to prevail during the fusing process, it cannot be assumed that a deterioration of the connection between the flange 11' and the body 12' will occur as the result of a gap that is too wide. In a hypothetical case whereby the length of the body 12' changes in length by 1.0 mm in the direction of the face of the one end, and the radius of the flange 11' changes by 0.1 mm, the change in the width of the gap 23 will be in the range of approximately 0.1 mm. Where the width of the gap 23 is in this order of magnitude, the connecting element 13' will continue to lie firmly against flange 11'. Because at the same time it also lies firmly in the half circular annular groove 14', a firm and stable connection between the flange 11' and the body 12' continues to be assured.

FIG. 5a shows a segment of a fuser roller as in FIG. 4a with an embodiment of the invention to include chamfers 16 and 17. Similar to the description relative to FIG. 4a, here, too, the connecting element 13 is located inside the annular groove 14 between the flange 11 and the body 12. Here, too, the flange 11 has an offset 25 whose shape is essentially quarter circular. The difference of the embodiment shown here with that described relative to FIG. 4a lies in the shaping of the annular groove 14 and the offset 25. Here, chamfers 16 and 17 have been added. The chamfer 16 is located in the area of the offset 25 and lies toward the inside of the fuser roller 3. Chamfers 17 are located in the area of the annular groove 14 on both edges of annular groove 14.

The chamfers 16 and 17 each form an angle of preferably 15° to 20° with the respective normal of the plane surface. In the present invention this angle can range from 0° to 45°. In order to provide a better representation of chamfers 16 and 17 no attempt has been made here to show the precisely correct angle. The angle shown here was selected arbitrarily and intentionally made larger so that the chamfers 16 and

17 can be easily recognized. If the angle of chamfers 16 and 17 were 0°, then this would indicate that no chamfers exist, and that the annular groove 14 and the offset 25 each possessed an edge with a right angle to the respective surface of each.

The chamfers 16 and 17 allow the connecting element 13 to roll more easily on the surfaces of the annular groove 14 and the offset 25. As a consequence a possible tilting of the connecting element 13 on the edge of the annular groove or the offset 25 and a consequential faulty concentric running of the fuser roller 3 can be avoided.

In FIG. 5b a detailed representation of the area 5b from FIG. 5 is shown. As was the case in FIG. 4b a position at 220°C is shown to supplement the view of the position of the connection between the flange 11 and the body 12 at room temperature. FIG. 5b shows the position at room temperature with a solid line and the position at 220°C with a dotted line. FIG. 5b is a schematic representation to show the changes in position. It is not true to scale. The objects at the 220°C position are also identified by broken lines leading to their reference numbers.

When the same shifting of the flange 11 and the body 12 occurs here as in FIG. 4b, the result is also a gap 23. The width of the gap is approximately 13% greater than the gap in an example embodiment without chamfers 16 and 17, and in an actual case would be about 1.13 mm with a 1.00 mm change in length of the body 12' and a 0.60 expansion of the flange 11'.

At this expansion of the flange 11' and the body 12', the connecting element 13' still lies against chamfer 16' of the offset 25'. Even when larger expansions occur a commensurate positioning continues to be assured, and no tilting of the connecting element 13' onto the edge of offset 25' takes place. By the prevailing forces, in particular the tug of the spring plate 29, the flange 11' is pressed up against the connecting element 13' such that the orientation of the effects produces a 90° angle to the plane of the offset 25', or to the chamfer 16' of the offset 25'. The same applies to further transfer of force by connecting element 13' to chamfer 17' of the annular groove 14'. The transfer of force is hereby linear through the connecting element 13' so that it cannot result in torsional moment around an edge.

In the case of an arrangement such as is shown in FIGS. 4a or 4b, under certain circumstances torsional moment on the connecting element 13'can result. The connecting element 13' continues to lie here on the edge of annular groove 14'. The prevailing forces cause a force vertical to an axis of inertia of the connecting element 13', whereby this axis lies here vertical to the edge of the annular groove 14'. Because of this torsional moment, a tilting of the connecting element 13' cannot always be avoided. A further adaptive rolling of the connecting element 13' can be prevented and the connection between the flange 11' and the body 12' can be adversely affected; at least faulty concentric running of the fuser roller 3 cannot always be precluded.

In FIG. 6, a segment of an end of the fuser roller 3 along with an added, integrated reflector plate 18 may be seen. This segment is the same as that shown in FIG. 3. The reference numbers that identify the same objects as shown in FIG. 3 have been left out here for the sake of simplicity. Added here on the inside of the fuser roller 3 and on the inward facing side of the flange ll is a reflector plate 18. A drilled hole 20, into which a dowel 19 affixed to the reflector plate 18 is fitted, has been provided in the flange 11 for attaching the reflector plate 18. This dowel 19 can, e.g., be threaded for insertion into the bored hole 20. Using a dowel 19 to install the reflector plate 18 on the flange 11 makes it possible to easily replace the reflector plate as needed.

A few of the reflector segments 27 are shown on the reflector plate 18. The individual reflector segments 27 form an angle with the plane of the reflector plate 18 so that each of them is aimed at the inside walls of the fuser roller 3. In this way heat rays 28 that are emitted from the heat source 10 toward the flange 11 are reflected directly toward the inside walls of the body 12 and can thus contribute to heating the outer coating of the fuser roller 3, and consequently also contribute to fusing the toner on a sheet 6.

FIG. 7 shows an overhead view of the reflector plate 18 with partial representation of reflector segments 27. The reflector segments 27 are circular segments that are arranged concentrically around the center of the reflector plate 18.

The center of the reflector plate 18 should coincide with the center of the flange 11. To provide a better view not all of the reflector segments 27 that are affixed to the reflector plate are shown; only an illustrative few are shown.

According to the invention, the insertion of the flange 11 into the body 12 and the connection between the flange 11 and the body 12 should be such that, first of all, the flange 11 is inserted into the body 12. The area of the flange 11 with the greatest expansion up to the offset 25 should then lie behind the annular groove 14. In this way it is possible to then insert the connecting elements 13 into the space between the flange 11 and the body 12. In doing so one must be careful to assure that all of the connecting elements 13 ultimately lie in the annular groove 14.

Now the spring plate 29 can be placed on the shoulder 21 on the end of the body 12. Using screws 15, the spring plate 29 should be attached to the flange 11. When these screws 15 are tightened, the offset 25 of the flange 11 will be pressed against the connecting elements 13. Since the connecting elements 13 lie inside the annular groove 14, they will be clamped in by this action, while the spring plate 29 allows a certain amount of flexibility. This applies whether or not chamfers 16 and 17 are present. Consequently, having been attached with screws to the flange 11, placed upon the shoulder 21, and pressed against the connecting elements 13 inside the annular groove 14, the spring plate 29 assures a stable connection between the flange 11 and the body 12 of the fuser roller 3.

When the fuser roller 3 is heated, the flange 11 and the body 12 expand. The connecting elements 13 can then shift by a rolling motion into the new positions of the annular groove 14' and the offset 25'. Because the flange 11' then follows this change by virtue of spring plate 29', a stable connection can continue to be assured. This applies, in particular, for the case described herein where the temperature is 220 °C, a temperature that the metal of the fuser roller can actually reach during operation. It is evident that there is even more latitude for higher temperatures.

Pressure against the flange 11 and the connecting elements 13 and thus against the body 12 is assured, especially in the embodiment with chamfers 16 and 17 on the offset 25 and the annular groove 14, and this pressure cannot lead to a tilting of

the connecting elements 13 with a resulting non-concentric operation of the fuser roller 3. Also, in this embodiment, no torque can develop that works on the connecting elements 13, because the contact point between the connecting element 13 and the annular groove 14 lies inside of the surface of the chamfer 17. In the embodiment without chamfers 16 and 17 the edge of the annular groove 14 would serve as the contact point, around which a torsional moment could be developed.

The present invention assures the establishment of a stable connection between the flange 11 and the body 12 of a fuser roller 3, which remains stable and does not develop stresses, even when the fuser roller 3 is heated to temperatures of 220°C, e.g., that are necessary for the fusing process. Because the connecting elements 13 are able to follow the expansions, and the flange 11 follows these changes by the spring plate 29, the flange 11 and the body 12 can expand without constraint and without exercising commensurate forces upon one another that could lead to stresses and warping. This enables the achievement of better outer surface textures for the fuser roller 3 even at higher temperatures and at the least, an improved running pattern. Preventing expansions inside the connection expands its durability.

Grounds Of Rejection To Be Reviewed On Appeal

In the Final Office Action mailed March 17, 2005, the Examiner has finally rejected Claim 1 under 35 U.S.C. §103(a) as being unpatentable over Onishi (JP2000214712) in view of Nagafuji (U.S. pg pub 2002/0051662); finally rejected Claims 1 and 3 under 35 U.S.C. §103(a) as being unpatentable over Onishi in view of Miller (U.S. Pat. No. 4,506,936); and finally rejected Claims 6-8 under 35 U.S.C. §103(a) as being unpatentable over Onishi in view of Miller as applied to Claim 3, and further in view of Chen (U.S. Patent No. 6,224,166). Furthermore, the Examiner has objected to Claims 4 and 9 as being dependent upon a rejected base claim, but containing allowable subject matter. Accordingly, the issue to be resolved is the propriety of the combination of the cited references and the applicability of the combination in forming the basis for the rejection of the appealed claims as being unpatentable over such cited references, and the propriety of the objection of the claims subject to objection.

Grouping Of The Claims

Independent Claim 1 and Claims 3, and 6-8 dependent on Claim 1 stand or fall together, Claim 1 being the representative claim. Separately, Claims 4 and 9, dependent on Claim 1, stand or fall together. Claims 4 and 9, indicated as drawn to allowable subject matter, do not stand or fall with the prior designated claim group in that they are directed to a distinct construction feature of Appellant's invention not covered in such prior designated claim group.

Arguments

Claim 1 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Onishi in view of Nagafuji. The Onishi reference is directed to a fusing roller construction with a heat roller (35), together with a core roller (33), within a housing (H). Flanges (37,40) are provided to close the roller ends, and support connections that include bearings (58, 59) which allow for revolving of the rollers relative to the housing. The Examiner has cited the Nagafuji reference as teaching the use of ball bearings (16, and the specification) for a fusing apparatus roller.

It is respectfully submitted that the Examiner has failed to appreciate the basic problem that Appellant's invention deals with, and the manner in which Appellant's invention has solved such problem. Specifically, fuser apparatus typically include a heated fuser roller in nip relation with a pressure roller. The heated fuser roller has end flanges, which are mounted in bearings, to enable the fuser roller to rotate to feed sheets through the fusing nip to fuse a marking particle image to the sheet by heat and pressure. The heated fuser roller and the flanges are subjected to high temperatures in order to accomplish desired high quality image fusing. Since the heated fuser roller and the end flanges need to have different physical characteristics, they are formed of different materials, and thus exhibit different rates of thermal expansion. This results in the connection between the heated fuser roller and the flanges being subjected to undue stresses, which can damage the connection there-between and shorten the life of the fuser apparatus.

Appellant's invention provides an interconnection between the heated fuser roller and the end flanges that enables the accommodation for differing rates of thermal expansion. As particularly recited in the independent Claim 1, the connection between the fuser roller and the end flanges incorporates at least one substantially ball-shaped connecting element, that is movable in a rolling motion relative thereto to balance out, in every direction possible, environmentally induced changes in the sizes of the roller body and the end flanges. That is, the connection can accommodate relative longitudinal movement along the fuser roller axis, relative movement transverse to the fuser roller axis, and relative rotational movement about the fuser roller axis.

The prior art, when viewed either individually or in any proper combination fails to teach such interconnection. The ball bearings of the Nagafuji reference do not accommodate relative movement in any direction other than rotational movement about the roller axis. Actually, ball bearings are typically captured in fixed races (see, for example, the Miller and Chen references discussed below) to accommodate movement in only one direction. While Appellant makes no contention that the ball bearings of the Nagafuji reference could not be substituted for the bearings of the Onishi reference, such combination would respectfully not teach Appellant's invention as claimed. The proposed bearing substitution does not provide for a stress-accommodating connector between a heated fuser roller and end flanges, but rather would only enable general rotation of the end flanges, about the heat roller axis, with respect to the housing. Accordingly it is respectfully submitted that the proposed combination would not teach one of ordinary skill in the art to provide a connecting arrangement to accommodate for differing rates of thermal expansion, between a heat roller and its end flanges, in multiple directions.

The Examiner has rejected Claims 1 and 3 under 35 U.S.C. §103(a) as being unpatentable over Onishi in view of Miller; and has rejected Claims 6-8 under 35 U.S.C. §103(a) as being unpatentable over Onishi in view of Miller, and further in view of Chen. As discussed immediately above, the Examiner considers the Onishi reference as teaching a fusing apparatus having a connecting member between a heat

roller and end flanges, with the connector including a bearing. The Miller and Chen references have been cited to show bearing assemblies of a ball shape (Miller) and ball races of a quarter circle configuration (Chen).

The Examiner contends that the references are from analogous art because they all deal with bearings. This contention is respectfully traversed. Unlike the above combination of the Onishi and Nagafuji references which both come from the field of fusing apparatus, the bearings of the Miller and Chen references are general bearing structures, in a myriad of bearing references, which are not especially designed to operate in extreme temperature environments. Therefore, it is respectfully submitted that one of ordinary skill in the art would not look in the general bearing art when looking for a bearing that would be capable of being subjected to extreme environmental conditions. Therefore, the proposed respective combinations of the Onishi and Miller and Chen references are not considered proper.

Even if, *arguendo*, it was determined that the respective combinations of the Onishi and Miller and Chen references as proposed were proper, it is respectfully submitted that neither combination would render Appellant's claimed invention obvious to one of ordinary skill in the art. As discussed above, the Onishi reference does not teach a fusing apparatus having a connecting member between a heat roller and end flanges, with the connector including a bearing. The bearing of the Onishi reference enables the heated fuser roller to rotate about the heated fuser roller axis (i.e., relative to the housing). This would be equivalent to bearings mounted on the exterior hubs of the end flanges of Appellant's fuser roller for connection to the printing machine. Accordingly, the substitution proposed by the Examiner would still fail to accommodate for different relative thermal expansion rates, by rolling motion in every direction, of the heated fuser roller and the end flanges. Therefore, Appellant's invention as recited in the rejected claims would not be obvious to one of ordinary skill in the art.

As noted above, the Examiner has objected to Claims 4 and 9 as being dependent upon a rejected base claim, but containing allowable subject matter. Claims 4 and 9 are directed to aspects of the specific construction of the end flanges

of the fuser roller. These claims are dependent respectively on Claim 1, and as such contain all the limitations thereof. Since the specific recited end flange constructions of the respective claims have not been found in the prior art, and because Claim 1 is respectfully considered allowable for the reasons fully discussed above, the objections to Claim 4 and 9 are no longer proper.

<u>Summary</u>

The references relied on by the Examiner cannot be properly combined in any manner which would teach, or make obvious to one of ordinary skill in the art, Appellant's invention as claimed in the claims herein on appeal. Furthermore, as a whole, in view of the applied prior art, or any other prior art known to Appellant, no references have been cited which alone, or in any proper combination, would render Appellant's invention obvious to one of ordinary skill in the art. Accordingly, the appealed Claims 1, 3, 4, and 6-9 patentably distinguish over the prior art. Therefore, the Examiner's final rejection under 35 U.S.C. §103(a), and the claim objections, are improper, and it is respectfully requested that such rejection should be reversed and the appealed Claims 1, 3, 4, and 6-9 now allowed.

<u>Conclusion</u>

For the above reasons, Appellant respectfully requests that the Board of Patent Appeals and Interferences reverse the rejection (and objections) by the Examiner and mandate the allowance of Claims 1, 3, 4, and 6-9.

Respectfully submitted,

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Appendix I – Claims On Appeal

1. Fuser roller (3) for a printing machine with internal heating elements, which has a cylindrically shaped body (12) and which has flanges (11) that close off the ends, comprising: a connection that incorporates at least one substantially ball-shaped connecting element (13), for the body and the flanges, that is movable in a rolling motion relative thereto to balance out, in every direction possible, environmentally induced changes in the sizes of said body and said flanges.

3. Fuser roller (3) as in Claim 1, wherein said body (12) of the fuser roller (3) has an annular groove (14) with a half circular cross section in the vicinity of the connection area of said flange (11) and said body (12), which holds said ball-shaped connecting element (13).

4. Fuser roller (3) as in Claim 1, wherein said flange (11) can be inserted into the inside of said body (12) at the end of said body (12); and further including a spring plate (29) placed on the outer side of the end of said body (12) to attach said flange (11) that has been inserted into said body (12).

6. Fuser roller (3) as in Claim 3, wherein said flange (11) has on its rim that faces toward the inner side of said body (12), a quarter-circular shaped offset (25) that is matched to the shape of said ball-shaped connecting element (13).

7. Fuser roller (3) as in Claim 6, further including chamfers (16,17) on the edges of said half-circular shaped annular groove (14) and/or on the edges of said quarter-circular shaped offset (25).

8. Fuser roller (3) as in Claim 7, wherein said chamfers (16,17) have an angle between 0° and 45°, preferably between 15° and 20° relative to the vertical.

9. Fuser roller (3) as in Claim 1, further including heat ray (28) reflecting reflector elements on the side of said flange (11) that faces the inside of said body (12), said reflector elements arranged as ring shaped reflector segments (27) on a reflector plate (18).